In the claims:

This listing of the claims replaces all prior versions in the application.

1. (Currently Amended) An assembly for detecting gamma rays from a bulk material, the assembly defining a radiation region, the assembly comprising:

a radiation source adjacent the radiation region configured to irradiate the bulk material in the radiation region;

a first gamma ray detector positioned adjacent the radiation region and configured to detect gamma ray events including events from gamma rays secondarily emitted by the bulk material responsive to radiation from the radiation source;

a second gamma ray detector positioned adjacent the first gamma ray detector and configured to detect gamma ray events including events from gamma rays secondarily emitted by the bulk material responsive to radiation from the radiation source;

<u>a gamma ray shielding material between the first and second gamma ray detectors;</u> and

a coincidence module configured to receive signals indicating gamma ray events from each of the first and second gamma ray detectors and to identify events that are detected in coincidence in the first and the second gamma ray detectors.

2. (Original) The assembly of Claim 1, wherein the second gamma ray detector comprises an array of gamma ray detectors, each of the gamma ray detectors in the array configured to provide respective signals indicating gamma ray events.

3. (Original) The assembly of Claim 1, further comprising a first photomultiplier tube in communication with the first gamma ray detector and a second photomultiplier tube in communication with the second gamma ray detector.

4. (Currently Amended) The assembly of Claim 1, wherein the ~~signal processor~~ <u>coincidence module</u> is configured to determine coincidence counting rates between the first and second gamma ray detectors.

5. (Original) The assembly of Claim 4, wherein the coincidence counting rate is the total rate of coincidence between the first and second gamma ray detectors.

6. (Currently Amended) The assembly of Claim 4, wherein the ~~signal processor~~ coincidence module is configured to select a subset of the events from one of the first and second detectors and to identify gamma ray events in the other of the first and second detectors in coincidence with the selected subset.

7. (Original) The assembly of Claim 4, wherein the coincidence counting rate is the rate of coincidence between a first event and a second event, wherein the first event and the second event sum to a predetermined energy.

8. (Original) The assembly of Claim 7, wherein the predetermined energy is between about 1.5 MeV to about 11 MeV.

9. (Currently Amended) The assembly of Claim 1, wherein the ~~processor~~ coincidence module is configured to generate a two-dimensional plot based on the signals from the first and second gamma ray detectors.

10. (Original) The assembly of Claim 9, wherein the processor is configured to generate a one-dimensional diagonal summation plot based on the two-dimensional plot.

11. (Original) The assembly of Claim 1, further comprising a conveyor belt configured to transport the bulk material through the radiation region.

12. (Original) The assembly of Claim 1, further comprising a chute configured to continually transport the bulk material through the radiation region.

13. (Currently Amended) A method of detecting coincidence in gamma ray detectors for analyzing a bulk material comprising:

providing the bulk material in a radiation region;

irradiating the bulk material in the radiation region with a radiation source adjacent the radiation region;

detecting gamma ray events with a first gamma ray detector adjacent the radiation region, the gamma ray events including events from gamma rays secondarily emitted by the bulk material responsive to radiation from the radiation source;

detecting gamma ray events with a second gamma ray detector adjacent the first gamma ray detector, the gamma ray events including events from gamma rays secondarily emitted by the bulk material responsive to radiation from the radiation source; ~~and~~

<u>shielding gamma rays between the first and second gamma ray detectors; and</u>

identifying gamma ray events that are detected in coincidence in the first and the second gamma ray detectors.

14. (Original) The method of Claim 13, wherein the second gamma ray detector comprises an array of gamma ray detectors.

15. (Original) The method of Claim 13, wherein identifying gamma ray events comprises determining a coincidence counting rate between the first and second gamma ray detectors.

16. (Original) The method of Claim 15, wherein the coincidence counting rate is the total rate of coincidence between the first and second gamma ray detectors.

17. (Original) The method of Claim 15, wherein determining a coincidence counting rate comprises selecting a subset of the events from one of the first and second detectors and identifying gamma ray events in the other of the first and second detectors in coincidence with the selected subset.

18. (Original) The method of Claim 15, wherein the coincidence counting rate is the rate of coincidence between a first event and a second event, wherein the first event and the second event sum to a predetermined energy.

19. (Original) The method of Claim 18, wherein the predetermined energy is between about 1.5 MeV to about 11 MeV.

20. (Original) The method of Claim 13, further comprising generating a two-dimensional plot based on the signals from the first and second gamma ray detectors.

21. (Original) The method of Claim 20, further comprising generating a one-dimensional diagonal summation plot based on the two-dimensional plot.

22. (Original) The method of Claim 13, wherein providing the bulk material includes transporting the bulk material through the radiation region using a conveyor belt.

23. (Original) The method of Claim 13, wherein providing the bulk material includes passing the bulk material through the radiation region using a chute.